

AMENDMENTS TO THE CLAIMS

Claim 1 (currently amended): ~~Procedure~~ A procedure for the cold processing of tubular metal elements or other elements with dead or through holes, nuts, comprising the following machining steps:

- (a) preparing a blank of full metal material;
- (b) straightening the full metal material;
- (c) ~~cutting of~~ cutting of the metal material into pieces of a determined length;

~~(e)~~(d) passing each piece sequentially through a plurality of work stations of a work centre comprising several hydraulic presses, wherein operation of the hydraulic presses is controlled to limit the temperature of the work pieces to less than 700 degrees during processing in order to obtain a blank element presenting one or two longitudinally opposite dead holes separated by a central transverse section, ~~whereby~~ wherein each piece is first machined by a hydraulic press, then extracted from said hydraulic press by means of a suitable manipulator robot and conveyed to an adjacent hydraulic press for a subsequent machining operation; and

~~(d)~~(e) through drilling of the blank ~~by removal of this to remove the~~ central traverse section;

wherein the metal elements have a diameter greater than 30 mm.

Claim 2 (currently amended): ~~Procedure~~ A procedure for the cold processing of metal elements ~~such as standard and special shape extruded or pressed screws~~, comprising the following machining steps:

- (a) preparing a blank of full metal material;
- (b) straightening the full metal material;
- (c) ~~cutting of~~ cutting of the metal material into pieces of a determined length; and

~~(e)~~(d) passing each piece sequentially through a plurality of work stations of a multi-hydraulic-press plant, wherein operation of the hydraulic presses is controlled to limit the temperature of the work pieces to less than 700 degrees during processing in order to obtain a finished element with or without swarf or waste, ~~whereby~~ wherein each piece is first machined

by a hydraulic press, then extracted from said hydraulic press by means of a suitable manipulator robot and conveyed to an adjacent hydraulic press for a subsequent machining operation;

wherein the metal elements have a diameter greater than 30 mm.

Claim 3 (currently amended): The procedure according to claim 1, in which the A procedure for the cold processing of tubular metal elements or other elements with dead or through holes, nuts, comprising the following machining steps:

(a) preparing a blank of full metal material, wherein setting up and preparation of the full blank differs according to the metal material used;

(b) straightening the full metal material;

(c) cutting the metal material into pieces of a determined length;

(d) passing each piece sequentially through a plurality of work stations of a work centre comprising several hydraulic presses, wherein operation of the hydraulic presses is controlled to limit the temperature of the work pieces to less than 700 degrees during processing in order to obtain a blank element presenting one or two longitudinally opposite dead holes separated by a central transverse section, whereby each piece is first machined by a hydraulic press, then extracted from said hydraulic press by means of a suitable manipulator robot and conveyed to an adjacent hydraulic press for a subsequent machining operation; and

(e) through drilling of the blank to remove the central traverse section;

wherein the metal elements have a diameter greater than 30 mm.

Claim 4 (previously presented): The procedure according to claim 3, carried out on material consisting of stainless steel, wherein the stainless steel is initially treated by solution annealing and pickled in a balanced solution of sulphuric acid, hydrofluoric acid, potassium permanganate and hydrogen peroxide, and subsequently washed repeatedly by means of immersion in a salting tank in order to facilitate the pressing.

Claim 5 (previously presented): The procedure according to claim 3, carried out on material consisting of low-alloy steel, wherein this material is pickled in sulphuric acid and subsequently washed in a phosphating tank in which, by chemical reaction, a layer of zinc phosphate is created

on the surface of the piece, then immersed in a sodium stearate tank where, again by chemical reaction, a thin layer of zinc stearate forms on top of the previous layer of zinc phosphate.

Claim 6 (previously presented): The procedure according to claim 2, wherein the products undergo shearing which can be carried out by means of a mechanical press.

Claim 7 (previously presented): The procedure according to claim 2, carried out on starting material in the form of rolls, in which previously washed metal material is straightened by loading it on a wire-straightening unit designed to unroll the skein.

Claim 8 (previously presented): The procedure according to claim 2, carried out on starting material in the form of bars, in which these bars are loaded in bundles in a bar sectioning plant and in which the bars are presented at the cutting station in a synchronised way according to the needs of a machining centre consisting of the presses.

Claim 9 (previously presented): The procedure according to claim 7, in which the free end of the roll is pulled through a first set of rollers and then through a system of opposite rollers designed to straighten the wire and transfer it to a cutting unit.

Claim 10 (currently amended): The procedure according claim 8, in which the material is cut into pieces of a predetermined length, ~~advantageously by various possible procedures such as for example mechanical or hydraulic processes by means of one or mobile blades or by a circular saw.~~

Claim 11 (currently amended): The procedure according to claim 1, ~~a plant or machining centre wherein the work centre comprises~~ a series of hydraulic presses of various sizes and power levels connected by a transfer unit designed to move the pieces being machined.

Claim 12 (previously presented): The procedure according to claim 11, wherein the transfer unit consists of a series of gripper units powered by an appropriate source of energy.

Claim 13 (previously presented): The procedure according to claim 1, wherein the drilling is carried out by a special unit consisting of a vertical press.

Claim 14 (previously presented): The procedure according to claim 13, wherein this vertical press consists of a mechanical press.

Claim 15 (currently amended): The procedure according to claim[[1]] 11, wherein the functioning and synchronisation of the individual presses and of the transfer unit are controlled by a PLC or a microprocessor.

Claim 16 (currently amended): ~~Plant~~ A plant for the implementation of a procedure for the cold processing of tubular metal elements or other elements with dead or through holes, nuts comprising the following machining steps:

- (a) preparing a blank of full metal material;
 - (b) straightening the full metal material;
 - (c) cutting of the metal material into pieces of a determined length;
 - ~~(e)~~(d) passing the pieces sequentially through a plurality of work stations of a work centre comprising several presses in order to obtain a blank element presenting one or two longitudinally opposite dead holes separated by a central transverse section; and
 - ~~(d)~~(e) through drilling of the blank by removal of this central traverse section;
- wherein the metal elements having a diameter greater than 30 mm,
- wherein the plant comprises a series of hydraulic presses adjacent to each other, designed to carry out a successive series of pressing operations on pieces to be machined ~~whereby~~ wherein each piece is first machined by a hydraulic press, wherein operation of the hydraulic presses is controlled to limit the temperature of the work pieces to less than 700 degrees during processing, then extracted from said hydraulic press by means of a suitable manipulator robot and conveyed to an adjacent hydraulic press for a subsequent machining operation.

Claim 17 (previously presented): The plant according to claim 16, wherein the plant ~~it~~ also comprises a drilling or shearing station.

Claim 18 (previously presented): The plant according to claim 17, wherein this drilling or shearing station consists of a vertical mechanical press.

Claim 19 (previously presented): The procedure according to claim 9, in which the material is cut into pieces of a predetermined length, advantageously by various possible procedures by means of one or mobile blades or by a circular saw.

Claim 20 (currently amended): ~~The procedure according to any one of the claim 2,~~ A procedure for the cold processing of metal elements, comprising the following machining steps:

- (a) preparing a blank of full metal material, in which the setting up and preparation of the full blank differs according to the metal material used;
 - (b) straightening the full metal material;
 - (c) cutting of the metal material into pieces of a determined length; and
 - (d) passing each piece sequentially through a plurality of work stations of a multi-hydraulic-press plant, wherein operation of the hydraulic presses is controlled to limit the temperature of the work pieces to less than 700 degrees during processing in order to obtain a finished element with or without swarf or waste, wherein each piece is first machined by a hydraulic press, then extracted from said hydraulic press by means of a suitable manipulator robot and conveyed to an adjacent hydraulic press for a subsequent machining operation;
- wherein the metal elements have a diameter greater than 30 mm.

Claim 21 (previously presented): The procedure according to claim 20, carried out on material consisting of stainless steel, wherein the stainless steel is initially treated by solution annealing and pickled in a balanced solution of sulphuric acid, hydrofluoric acid, potassium permanganate and hydrogen peroxide, and subsequently washed repeatedly by means of immersion in a salting tank in order to facilitate the pressing.

Claim 22 (previously presented): The procedure according to claim 20, carried out on material consisting of low-alloy steel, wherein this material is pickled in sulphuric acid and subsequently washed in a phosphating tank in which, by chemical reaction, a layer of zinc phosphate is created

on the surface of the piece, then immersed in a sodium stearate tank where, again by chemical reaction, a thin layer of zinc stearate forms on top of the previous layer of zinc phosphate.

Claim 23 (previously presented): The procedure according to claim 2, characterised in that a plant or machining centre consists of a series of hydraulic presses of various sizes and power levels connected by a transfer unit designed to move the pieces being machined.

Claim 24 (previously presented): The procedure according to claim 23, wherein the transfer unit consists of a series of gripper units powered by an appropriate source of energy.

Claim 25 (currently amended): The procedure according to claim 1–2, wherein the drilling is carried out by a special unit consisting of a vertical press.

Claim 26 (previously presented): The procedure according to claim 25, wherein this vertical press consists of a mechanical press.

Claim 27 (currently amended): The procedure according to claim 11–2, wherein the functioning and synchronisation of the individual hydraulic presses and of the transfer unit are controlled by a PLC or a microprocessor.

Claim 28 (currently amended): ~~Plant~~ A plant for the implementation of a procedure for the cold processing of metal elements ~~such as standard and special shape extruded or pressed screws,~~ comprising the following machining steps:

- (a) preparing a blank of full metal material;
- (b) straightening the full metal material;
- (c) cutting of the metal material into pieces of a determined length; and
- ~~(e)~~(d) passing the pieces sequentially through a plurality of work stations of a multi-press plant in order to obtain a finished element with or without swarf or waste;

wherein the metal elements have a diameter greater than 30 mm,

wherein the plant comprises a series of hydraulic presses adjacent to each other, wherein operation of the hydraulic presses is controlled to limit the temperature of the work pieces to less than 700 degrees during processing, designed to carry out a successive series of pressing

operations on pieces to be machined ~~whereby~~ wherein each piece is first machined by a hydraulic press, then extracted from said hydraulic press by means of a suitable manipulator robot and conveyed to an adjacent hydraulic press for a subsequent machining operation.

Claim 29 (previously presented): The plant according to claim 28, wherein the plant also comprises a drilling or shearing station.

Claim 30 (previously presented): The plant according to claim 29, wherein this drilling or shearing station consists of a vertical mechanical press.